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| <b>Installation Guide</b>                |   |
| <b>Product</b>                           | PF850   |
| <b>Microscope</b>                        | Olympus IX81  |
| <b>Version</b>                           | 1.2   |
| <b>Author</b>                            | Simon Bush  |
| <b>Date</b>                              | 2/6/2020  |
| <b>Introduction</b>                      | The aim of this document is to provide a step-by-step guide for the installation of the PureFocus 850 laser autofocus system, and peripheral components, onto an Olympus IX71 microscope. |
| <b>Installation kit for Olympus IX81</b> | PF203<br>Wiring loom (3x wiring looms with molex connectors on either end)<br>Wiring loom cover   |

## Section 1: Preparing for installation

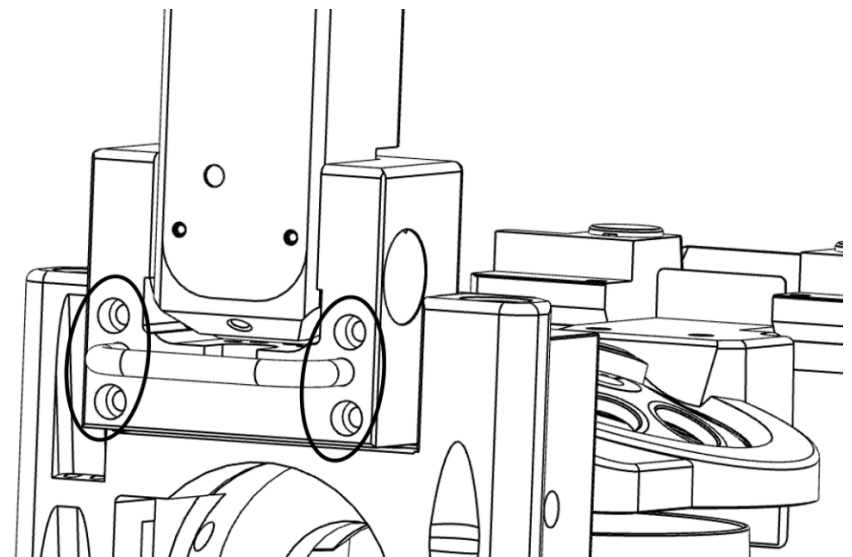
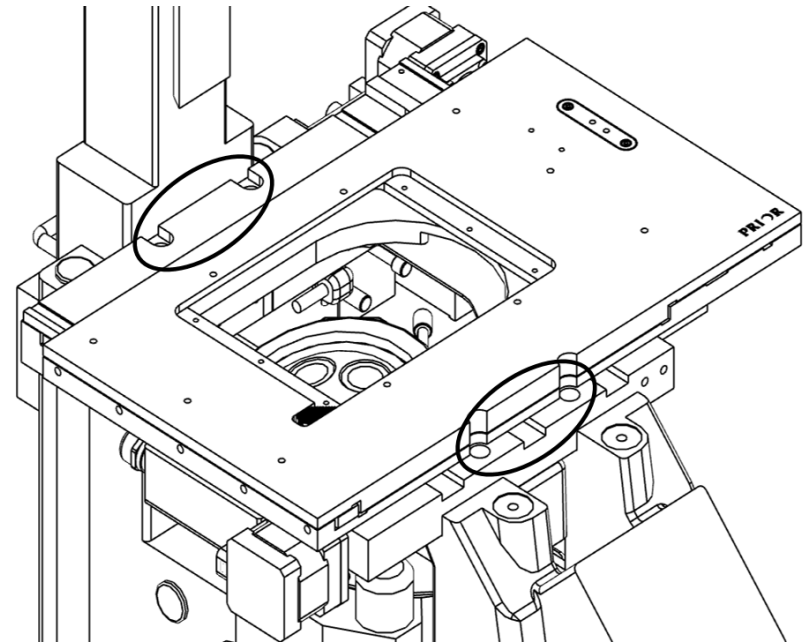
Remove the stage sample holder.

Remove all objectives from the microscope nosepiece, making a note of the positions from which they have been removed.

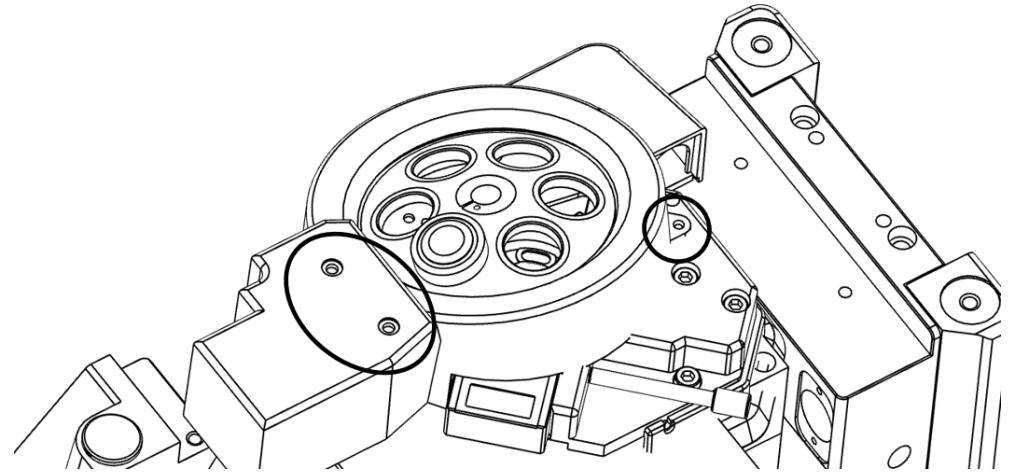
Unplug all cables from the microscope stage and from the brightfield illumination pillar. Olympus stages have two cable connections, one for each stage axis. Prior Scientific stages have a single 25-pin D-connector connection.

Remove the microscope stage by removing the four screws that attach it to the microscope body, two at the front and two at the rear of the stage body. Place the stage and screws in a safe location.

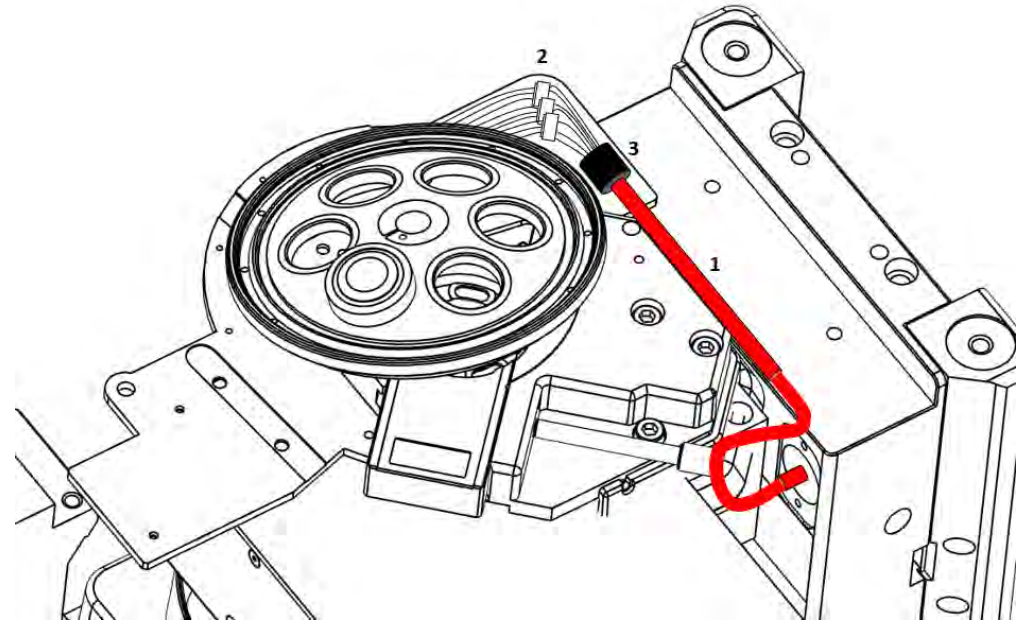
Remove the brightfield illumination pillar from the microscope. Use a hex-key to remove the four screws from the positions indicated. Prior Scientific advise that this operation will be safer and easier to complete with one person holding the pillar and another removing the screws. Place the pillar and screws in a safe location.



Remove the microscope nosepiece cover by removing the three screws indicated. Ensure the cover and screws are kept in a safe place.



Underneath the cover, a cable (1) that takes the route indicated into the body of the microscope. Three pairs of molex connectors (2) connect the wiring loom from the nosepiece to the wiring loom from the microscope body. The cable is routed through a small, right-angled metal bracket and plastic bush (3), which cannot be removed and must be integrated into the extended wiring loom.

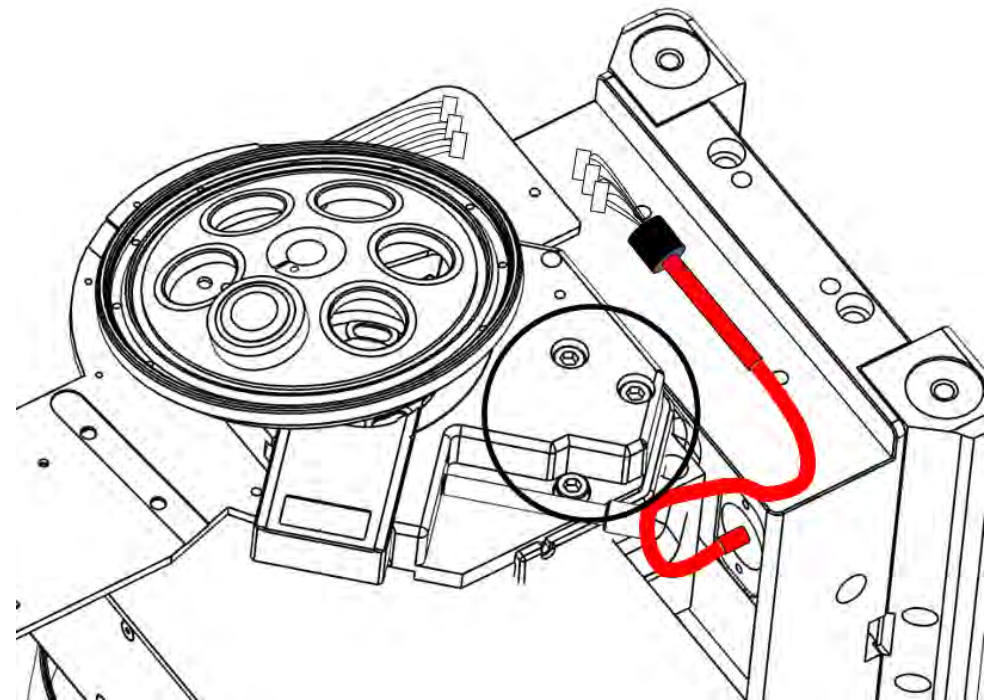


**WARNING:** Take care when performing the following procedure

Carefully detach the three mox connector pairs from one another. The wires nearest the nosepiece are thin so it is more appropriate to apply pulling forces to the wires closest to the microscope body. There are a pair of holes in the female mox connector; use pair of tweezers or small hex key to push down into these holes in order to overcome the small plastic clasps inside if the connectors do not slide apart easily. Remove the metal bracket by removing the pair of screws fixing it to the nosepiece body, leaving the plastic bush in place.

Remove the microscope nosepiece by removing the three screws indicated below. Place the nosepiece and screws in a safe location. Remove the plastic skirting found at the position indicated by removing the screws and cutting through the adhesive using a scalpel, razor blade or other available tool. This skirting does not affect the performance of the microscope.

The microscope is now prepared for installation of the PureFocus 850.

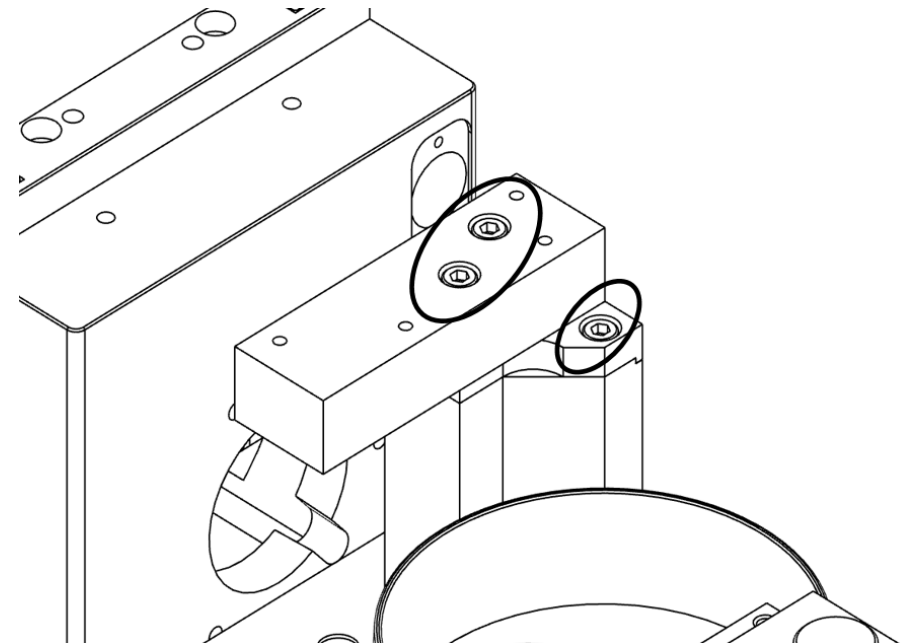
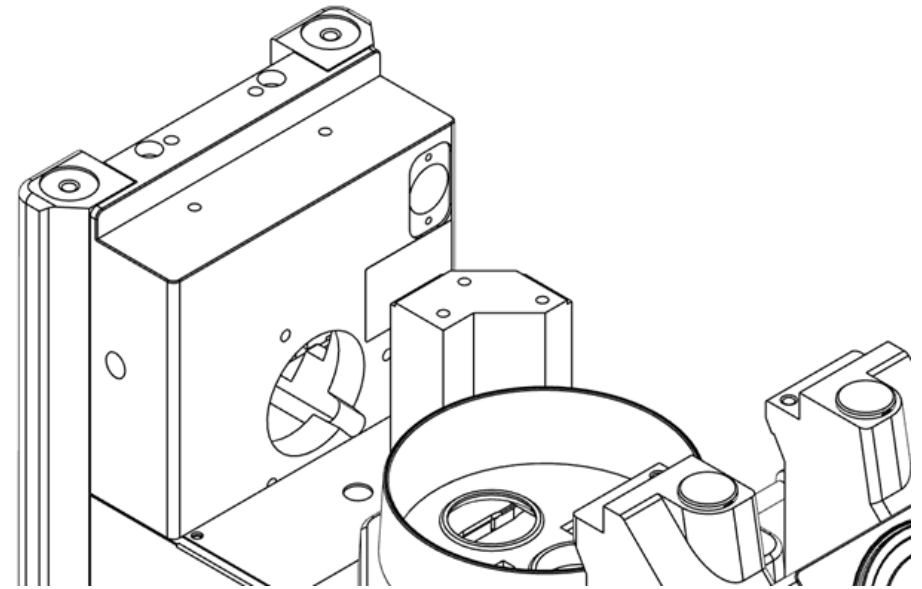


## Installing the PF203 mounting kit (Part 1 of 2) and PureFocus 850 head

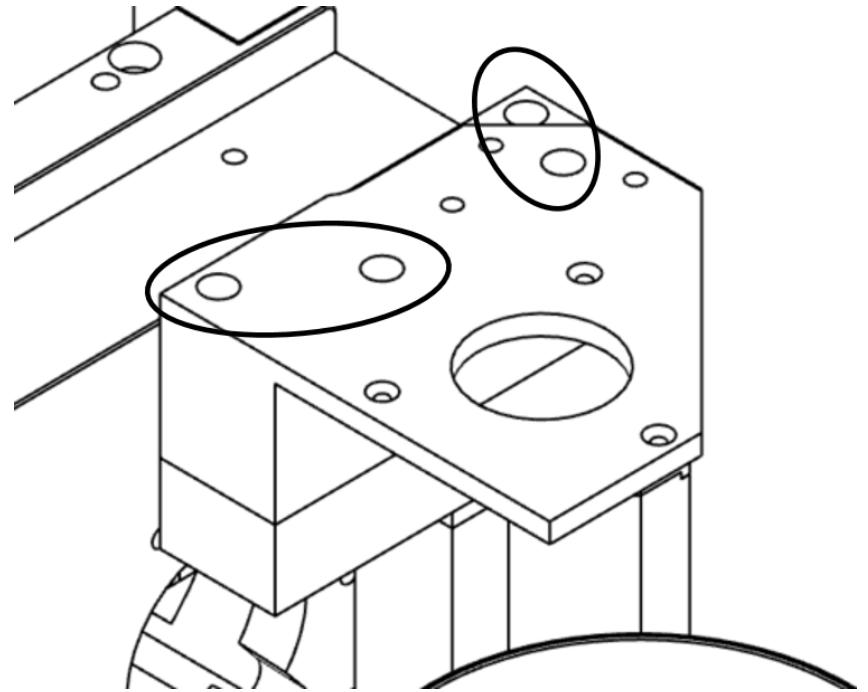
The PF203 mounting kit allows the PureFocus 850 to fit into the optical path, and contains the following components and their associated screws.

| Part Description                     | Quantity |
|--------------------------------------|----------|
| PF544 Nosepiece Spacer Base          | 1        |
| PF545 PureFocus 850 Mounting Bracket | 1        |
| PF546 Illumination Pillar Spacer     | 1        |
| PF547 Stage Pillar                   | 4        |

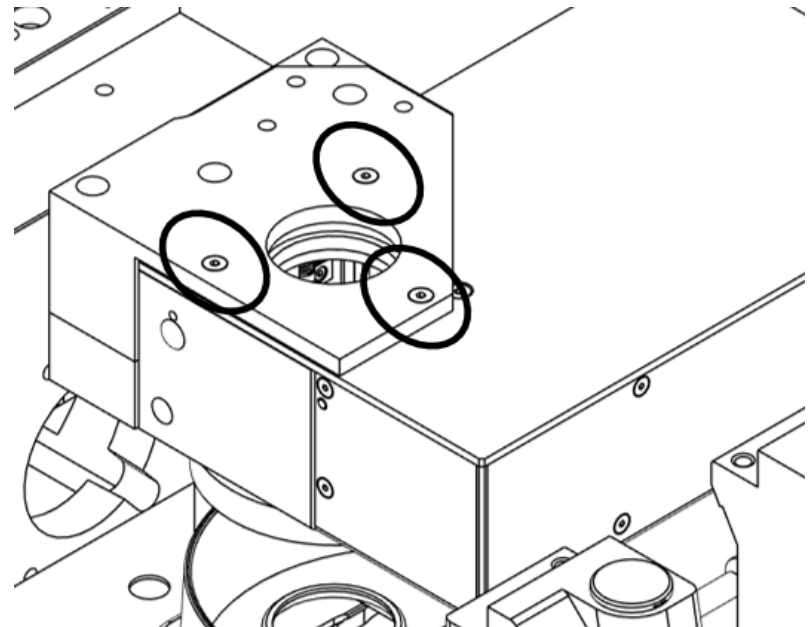
Fix the PF544 Nosepiece spacer to the top of the exposed focusing pillar using the screws provided.

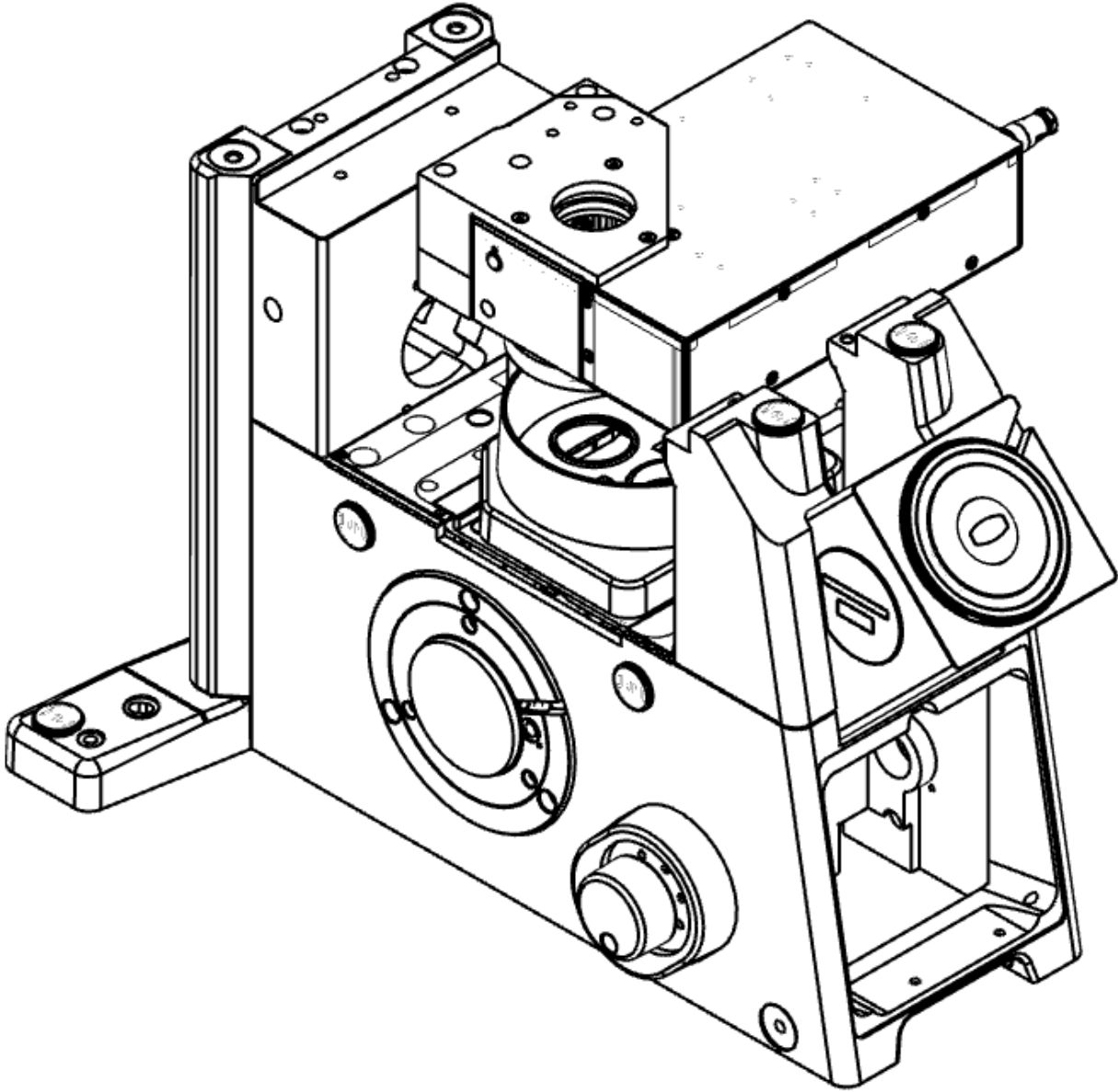


Use the four T201 screws to fix the PF545 PureFocus 850 mounting bracket to the PF544 fixing by screwing them into the four recessed holes indicated below.



Install the PureFocus 850 head onto the PF545 using the three fixing points indicated below. The Purefocus labels should be upside down when this is complete, which is normal for an inverted microscope. The microscope should now look as shown overleaf.

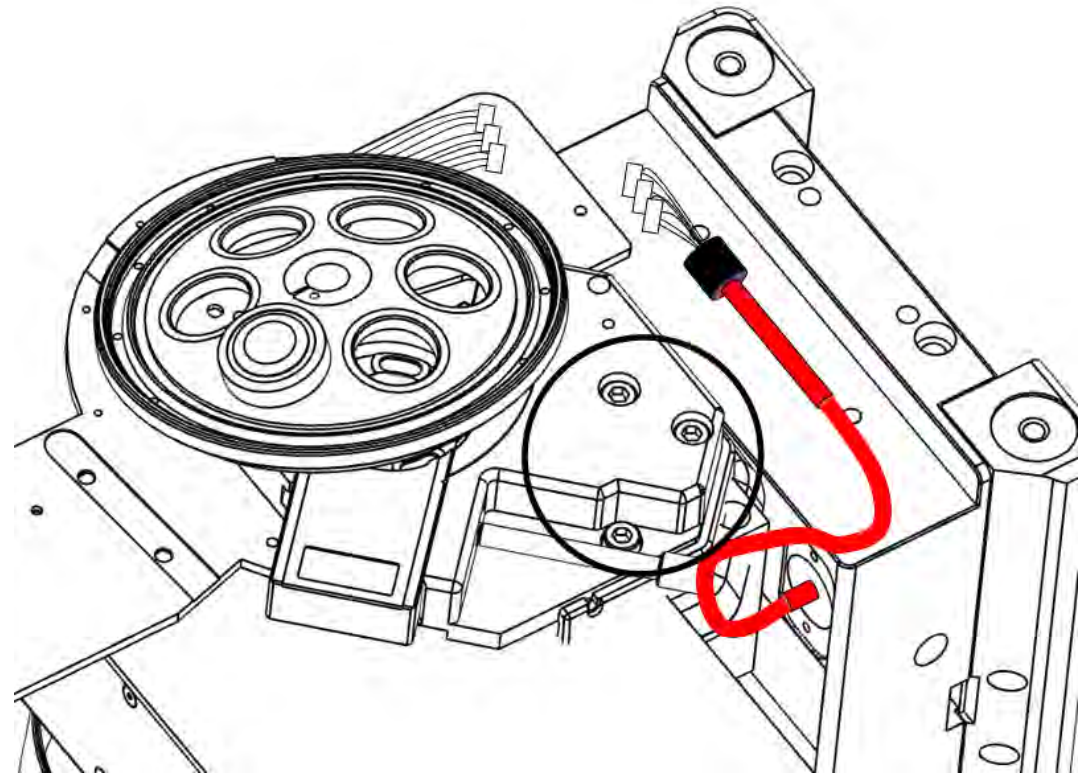




## Refitting the microscope nosepiece

Refitting the nosepiece requires the other two components of the kit, the wiring loom and the wiring loom cover. The nosepiece can be reattached after PF203 installation, but it is recommended to do so after attaching the PF850 head to the PF545 and prior to the PF546 and 4x PF547.

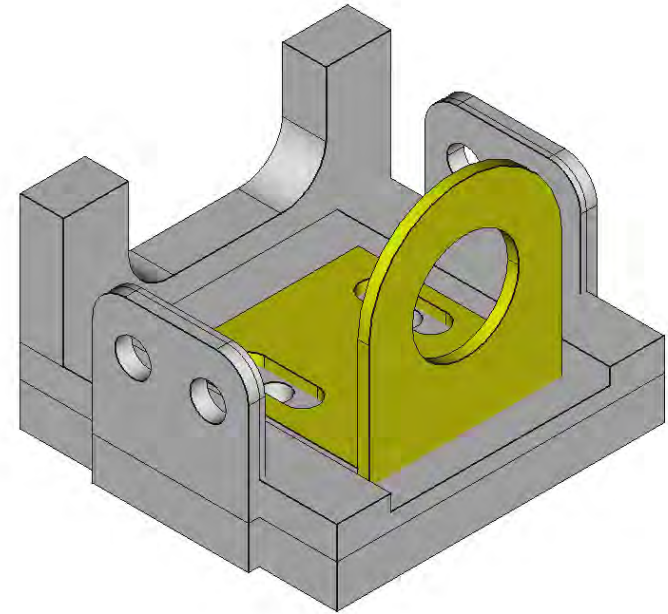
Move the cable leading from the microscope body, which is currently detached from the nosepiece, to a place where it will be accessible.



Refit the nosepiece without cover using the three screws indicated below.

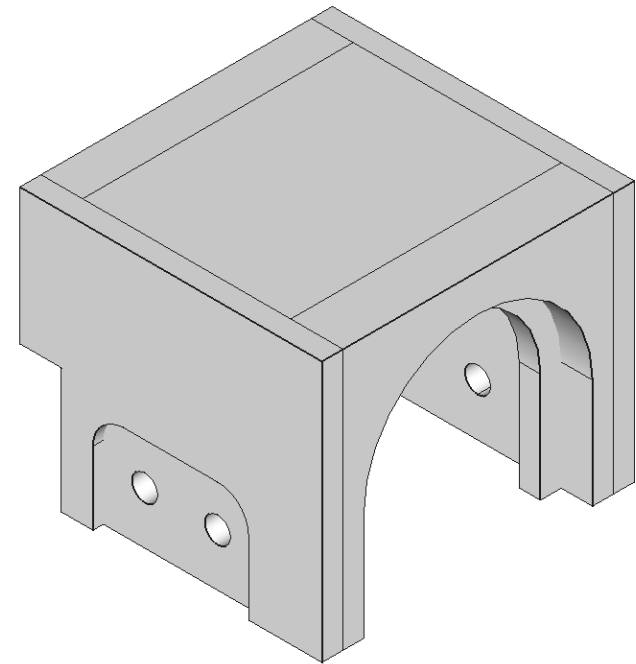


The metal bracket and plastic bush will be attached to the cable leading to the microscope body. Screw the metal bracket (shown in yellow) into the bottom half of the wiring loom cover 'box' as shown using two m3x4 button head screws. Three molex connectors should now be inside the box. Their corresponding connectors will still be attached to the nosepiece.

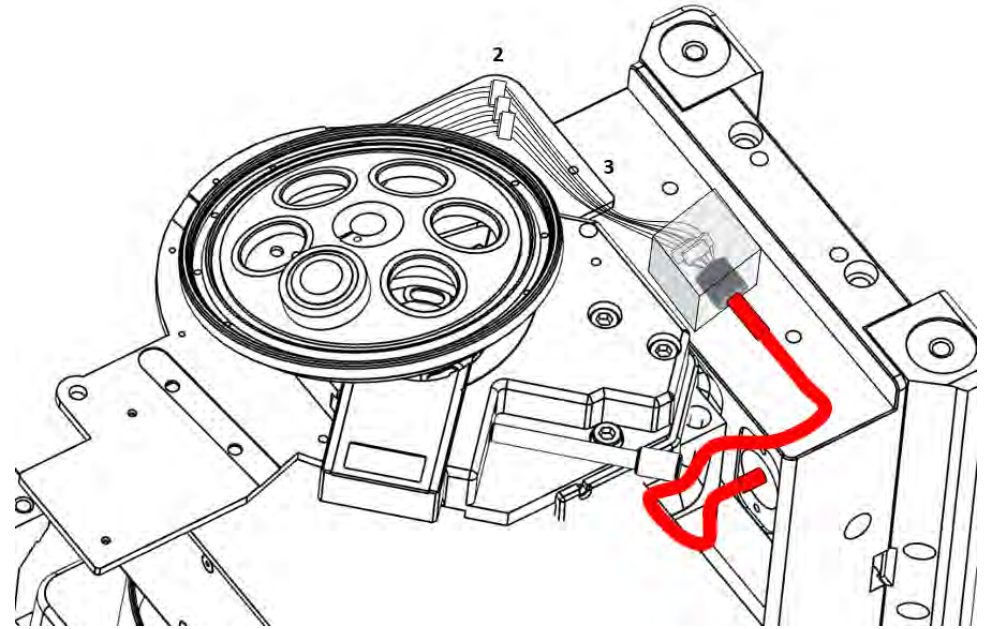


Connect the molex connectors in the nosepiece and the box together using the wiring loom. The connectors are all different sizes so they cannot be mixed up.

Slide the top of the box over the connectors. The cable to the microscope body should emerge from the 'arch' shaped aperture. Holding the box by the top and bottom, screw two m3x4 button head screws into the pair of tapped holes on one side. Repeat with the other side.



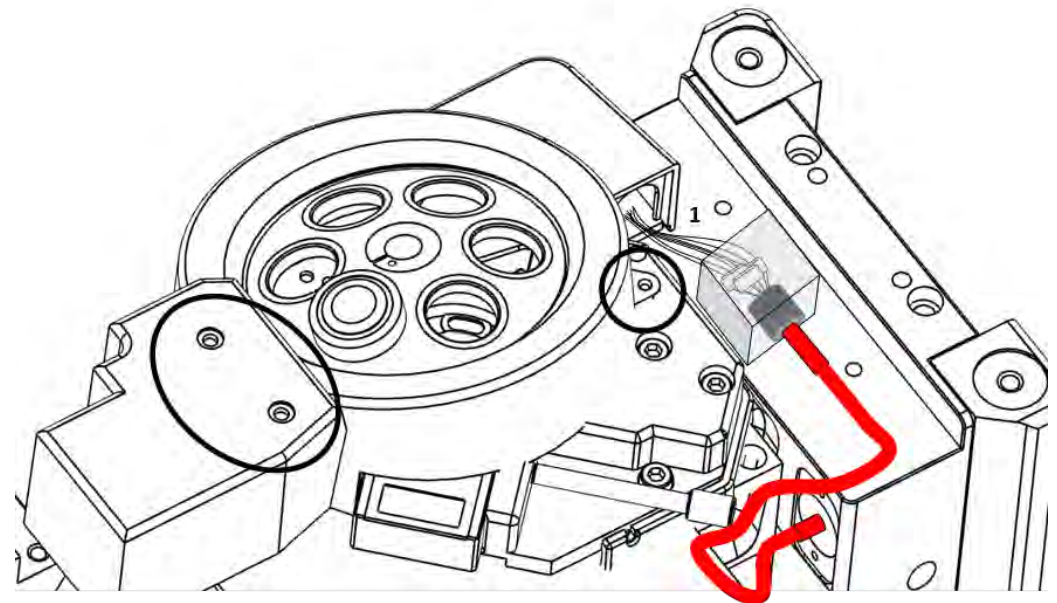
Position the box between the two stage mounting holes at the rear of the microscope. The cable from the microscopy boy (1) will now lead into the box (3), which contains one set of molex connectors, and the other set of molex connectors (2) will sit close to the nosepiece



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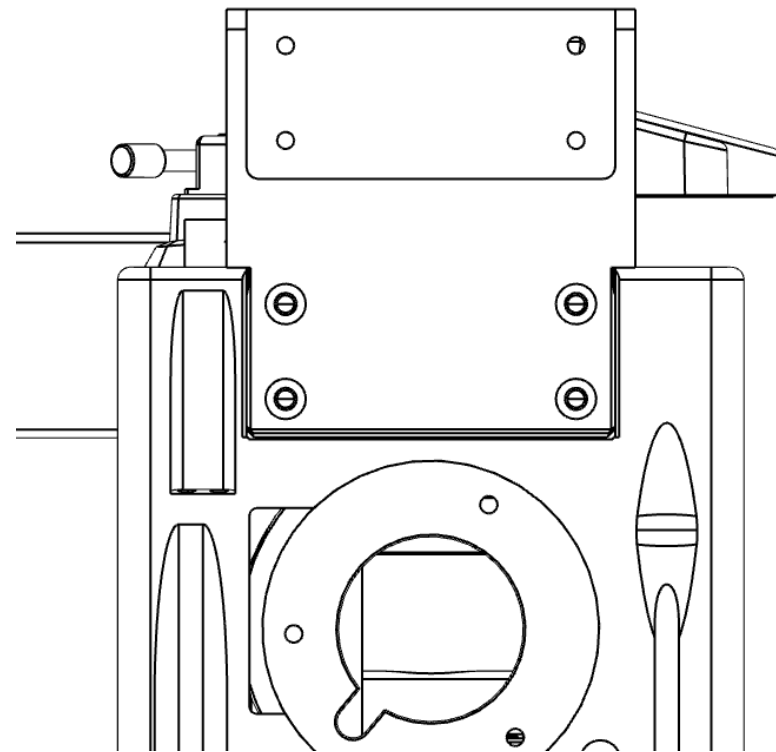
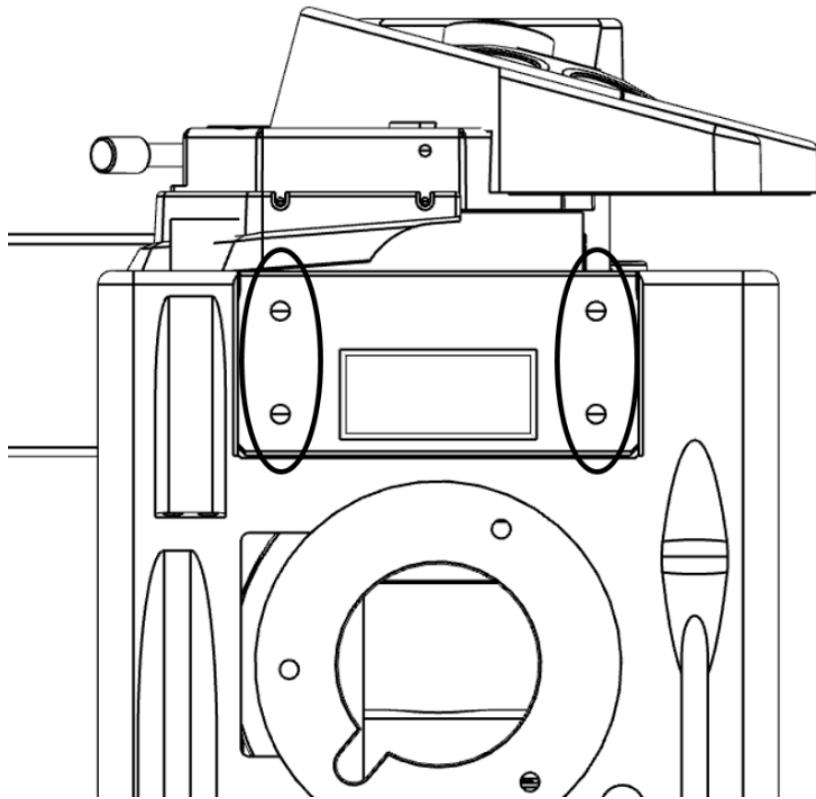
Refit the microscope nosepiece cover using the screws that were removed earlier. Ensuring that no wires from the nosepiece become trapped by the casework, and that the three remaining molex connector pairs are housed within the casing. The wiring loom should lead out from the aperture at the rear of the nosepiece (1). The nosepiece wiring should now appear as in the diagram below.

If convenient to do so, check the operation of the nosepiece at this stage.

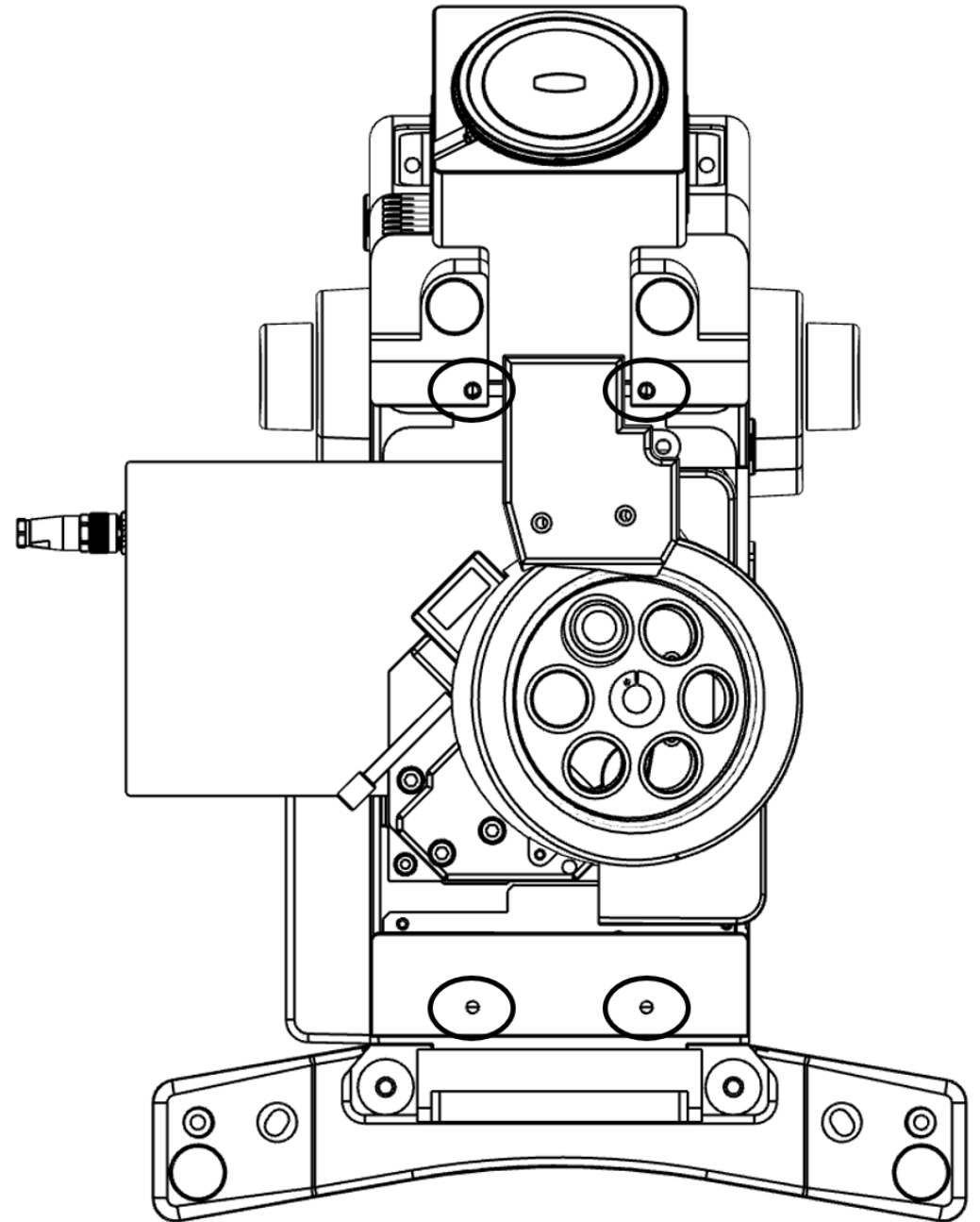


## Installing the PF203 mounting kit (Part 2 of 2)

Fit the PF546 into the slot in the rear of the microscope left following removal of the illumination pillar, using the four screws provided.



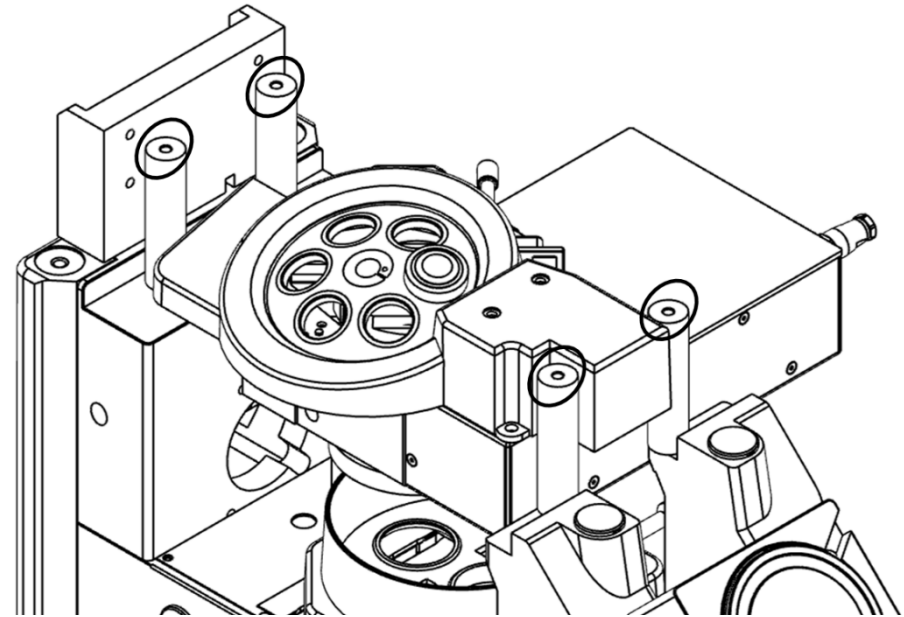
Fit the four PF547 pillars into the stage mounting points at the front and rear of the microscope stage. Route the nosepiece wiring in front of the pillars at the rear of the frame, with the box sat between them.



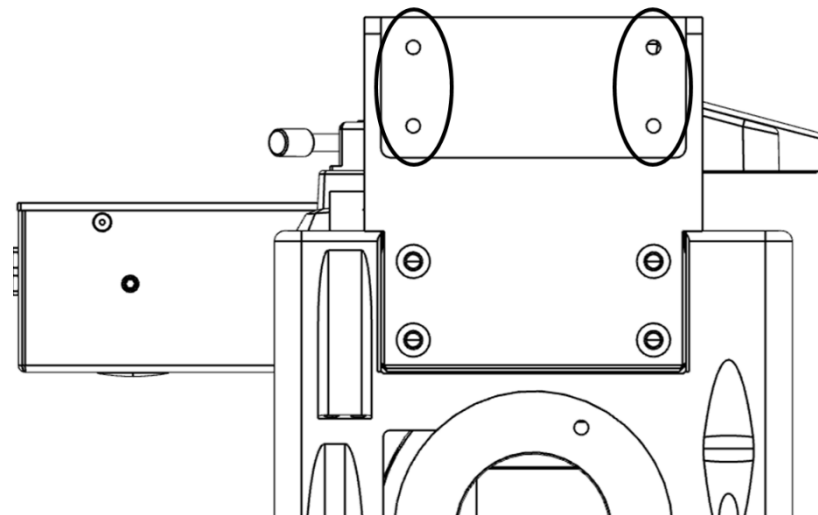
## Reassembling the microscope

Re-fit the stage onto the PF547 pillars at the points shown below. The stage will comfortably clear the nosepiece.

Re-attach the objectives into the correct positions on the nosepiece and fit the sample holder onto the stage.



Re-attach the illumination pillar onto the PF546 at the points indicated, using the screws supplied with the microscope. Reconnect all removed cables to the stage and illumination pillar.



## **Installing the PureFocus 850 controller and focusing mechanism**

To connect the PureFocus 850 controller to the head, please refer to the PureFocus 850 user manual, which is available for download from [www.prior.com](http://www.prior.com).

To install the focusing mechanism intended for use with your PureFocus 850 onto the microscope, please refer to the appropriate installation manual, which are available from [www.prior.com](http://www.prior.com) or, for Queensgate-branded piezo nanopositioning devices, [www.nanopositioning.com](http://www.nanopositioning.com). Refer to the appropriate manual for third party devices. Common focusing systems used with the PureFocus 850 when mounted on an Olympus IX81 are:

PS3H122OLM focus motor

QGSP400-D1 400 $\mu$ m nanopositioning stage and controller

The full optical alignment and setup procedure can be found in the PureFocus 850 user manual.